

Amendments to the Claims

This listing of claims, if entered, will replace all prior versions and listings of claims in the above-identified application.

Listing of Claims

1. (Currently Amended) A method comprising:
writing data to a first and second data volume, wherein
the first data volume is a first primary volume,
the second data volume is a second primary volume,
the first and second data volumes are unrelated data volumes,
the first primary volume and the second primary volumes are coupled
to a host node, and
the host node processes requests received from at least one client
computer to perform transactions on the first primary volume
or the second primary volume;
~~writing data to first and second data volumes, wherein the first data volume~~
~~is unrelated to the second data volume in that the second data volume~~
~~is not a point-in-time copy or a modified point-in-time copy of the first~~
~~data volume;~~
refreshing the second data volume to the data contents of the first data volume
that existed at time T, wherein refreshing the second data volume
comprises overwriting ~~all~~ data of the second data volume with data of the
first data volume that existed at time T;
modifying data of the first data volume while the second data volume is being
refreshed to the data contents of the first data volume that existed at time
T; and
modifying data of the first data volume after the second data volume has been
refreshed.
2. (Cancelled)

3. (Cancelled)

4. (Original) The method of claim 1 further comprising creating one or more PIT copies of the first data volume prior to refreshing the second data volume to the data contents of the first data volume.

5. (Previously Presented) The method of claim 4 wherein one of the PIT copies of the first data volume is in a virtual state when the second data volume is refreshed to the data contents of the first data volume.

6. (Previously Presented) The method of claim 1 further comprising an act of preserving the second data volume, wherein said preserving comprises creating one or more PIT copies of the second data volume prior to refreshing the second data volume to the data contents of the first data volume.

7. (Previously Presented) The method of claim 6 wherein one of the PIT copies of the second data volume is in the virtual state when the second data volume is refreshed to the data contents of the first data volume.

8. (Previously Presented) The method of claim 1 wherein the first data volume is a real or virtual PIT copy of another data volume when the second data volume is refreshed to the data contents of the first data volume.

9. (Previously Presented) The method of claim 1 wherein the second data volume is a real or virtual PIT copy of another data volume when the second data volume is refreshed to the data contents of the first data volume.

10. (Original) The method of claim 1 wherein refreshing the second data volume further comprises generating first and second maps in memory, wherein each of the first and second maps comprises a plurality of entries, wherein each entry of the first map corresponds to a respective memory block that stores data of the first data volume, and wherein each entry of the second map corresponds to a respective memory block that stores data of the second data volume.

11. (Previously Presented) The method of claim 10 wherein refreshing the second data volume further comprises:

setting a first bit in each entry of the first map, wherein each first bit of the first map is set to indicate its respective memory block stores valid data; and
clearing a first bit in each entry of the second map, wherein each first bit of the second map is set to indicate its respective memory block stores invalid data.

12. (Original) The method of claim 11 further comprising:

setting or clearing a second bit in each entry of the second map to indicate that its respective memory block stores data needed for a PIT copy of the second data volume.

13. (Previously Presented) The method of claim 1 further comprising an act of preserving the second data volume, wherein said preserving comprises creating a PIT copy of the second data volume before or while refreshing the second data volume to the data contents of the first data volume.

14. (Cancelled)

15. (Currently Amended) A computer readable medium storing instructions executable by a computer system, wherein the computer system implements a method in response to executing the instructions, the method comprising:

writing data to a first and second data volume, wherein

the first data volume is a first primary volume,

the second data volume is a second primary volume,

the first and second data volumes are unrelated data volumes,

the first primary volume and the second primary volumes are coupled
to a host node, and

the host node processes requests received from at least one client

computer to perform transactions on the first primary volume
or the second primary volume;

~~writing data to first and second data volumes, wherein the first data volume~~
~~is unrelated to the second data volume in that the second data volume~~
~~is not a point-in-time copy or a modified point-in-time copy of the first~~
~~data volume;~~

refreshing the second data volume to the data contents of the first data volume
that existed at time T, wherein refreshing the second data volume
comprises overwriting data of the second data volume with data of the first
data volume that existed at time T, and wherein the first data volume is
unrelated to the second data volume prior to refreshing the second data
volume to the data contents of the first data volume;

modifying data of the first data volume while the second data volume is being
refreshed to the data contents of the first data volume that existed at time
T; and

modifying data of the first data volume after the second data volume has been
refreshed.

16. (Cancelled)

17. (Cancelled)

18. (Previously Presented) The computer readable medium of claim 15 wherein the method further comprises creating one or more PIT copies of the first data volume prior to refreshing the second data volume to the data contents of the first data volume.

19. (Previously Presented) The computer readable medium of claim 18 wherein one of the PIT copies of the first data volume is in the virtual state when the second data volume is refreshed to the data contents of the first data volume.

20. (Previously Presented) The computer readable medium of claim 15 further comprising an act of preserving the second data volume, wherein said preserving further comprises creating one or more PIT copies of the second data volume prior to refreshing the second data volume to the data of the first data volume.

21. (Previously Presented) The computer readable medium of claim 20 wherein one of the PIT copies of the second data volume is in the virtual state when the second data volume is refreshed to the data contents of the first data volume.

22. (Previously Presented) The computer readable medium of claim 15 wherein the first data volume is a real or virtual PIT copy of another data volume when the second data volume is refreshed to the data contents of the first data volume.

23. (Previously Presented) The computer readable medium of claim 15 wherein the second data volume is a real or virtual PIT copy of another data volume when the second data volume is refreshed to the data contents of the first data volume.

24. (Original) The computer readable medium of claim 15 wherein refreshing the second data volume further comprises generating first and second maps in memory, wherein each of the first and second maps comprises a plurality of entries, wherein each entry of the first map corresponds to a respective memory block that stores data of the first data volume, and wherein each entry of the second map corresponds to a respective memory block that stores data of the second data volume.

25. (Previously Presented) The computer readable medium of claim 24 wherein refreshing the second data volume further comprises:

clearing a first bit in each entry of the first map, wherein each first bit of the first map is set to indicate its respective memory block stores valid data; and
setting a first bit in each entry of the second map, wherein each first bit of the second map is set to indicate its respective memory block stores invalid data.

26. (Previously Presented) The computer readable medium of claim 15 further comprising an act of preserving the second data volume, wherein said preserving further comprises creating a PIT copy of the second data volume before or while refreshing the second data volume to the data of the first data volume.

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Previously presented) The method of claim 1 further comprising:
modifying data of the second data volume while the second data volume is being refreshed to the data contents of the first data volume that existed at time T;

wherein, in response to the modifying the second data volume, the second data volume becomes a modified point-in-time copy of the first data volume that existed at time T.

31. (Previously presented) The computer readable medium of claim 15 wherein the method further comprises:

modifying data of the second data volume while the second data volume is being refreshed to the data contents of the first data volume that existed at time T;

wherein, in response to the modifying the second data volume, the second data volume becomes a modified point-in-time copy of the first data volume that existed at time T.

32. (Cancelled)

33. (New) A method comprising:

writing data to first and second data volumes, wherein

the first data volume is unrelated to the second data volume in that the second data volume is not a point in-time copy or a modified point in-time copy of the first data volume, and
the first data volume is unrelated to the second data volume after the writing;

refreshing the second data volume to the data contents of the first data volume that existed at time T, wherein refreshing the second data volume comprises overwriting data of the second data volume with data of the first data volume that existed at time T;

modifying data of the first data volume while the second data volume is being refreshed to the data contents of the first data volume that existed at time T; and

modifying data of the first data volume after the second data volume has been refreshed.